

George Mason University – CHEMISTRY 214
Laboratory Syllabus **Spring 2017**

Laboratory Manual: Suzanne Slayden, *Chemistry 213/214/251 Laboratory Manual; Fall 2016*, GMU, Available on Blackboard only.

Information regarding computer spreadsheet results can be accessed by using the following website. <http://chem.gmu.edu/results> Following the guidelines stated when processing and presenting data (tables, graphs, page layouts, etc.).

Day	Laboratory Experiment	Pages
Mon., Jan. 23 rd to Fri., Jan. 27 th	Expt. 0. Check-in, Enrollment Verification, Course Policies Lab Safety, and Initial Login to Database	
Mon., Jan. 30 th to Fri., Feb. 3 rd	Expt 1. Synthesis of a Coordination Compound of Fe(III); KTOF3 (formal lab report required); QUIZ #1	139
Mon., Jan. 6 th to Fri., Feb. 10 th	Expt 2. Determination of Water of Hydration in KTOF3 ; QUIZ #2; (Formal Lab Report Required)	147
Mon., Feb. 13 th to Fri., Feb. 17 th	Expt 3. KTOF3 Redox Titration of Oxalate in KTOF3; QUIZ #3; (Formal Lab Report Required)	153
Mon., Feb. 20 th to Fri., Feb. 24 th	Expt 4. Molecular Mass by Freezing Point Depression (formal lab report required); QUIZ #4	161
Mon., Feb. 27 th to Fri., Mar. 3 rd	Expt 5. Chemical Kinetics: Crystal Violet; QUIZ #5 (formal lab report required)	167
Mon., Mar. 6 th to Fri., Mar. 10 th	Expt 6. Measurement of Equilibrium Constant (formal lab report required); QUIZ #6	175
Mon., Mar. 13 th to Fri., Mar. 17 th	Spring Break	
Mon., Mar. 20 th to Fri., Mar. 24 th	Expt 7. Acidity Constant by pH Titration Curves; QUIZ #7;	185
Mon., Mar. 27 th to Fri., Mar. 31 st	Expt 8. Dissociation Constants of Acids and Bases; QUIZ #8 (LAB PRACTICAL)	207
Mon., Apr. 3 rd to Fri., Apr. 7 th	Expt 9. Molar Solubility and the Common-Ion Effect ; QUIZ #9	191
Mon., Apr. 10 th to Fri., Apr. 14 th	Expt 10. Thermodynamics of the Dissolution of Borax ; QUIZ #10 (formal lab report required)	199
Mon., Apr. 17 th to Fri., Apr. 21 st	Expt 11. Electrochemical Measurements; Cleanup and Checkout	217
Mon., Apr. 24 th to Fri., Apr. 28 th	LAB FINAL EXAM	

***Informal lab reports must be turned in prior to exiting lab on the day that the experiment is performed. Formal lab reports are due at the **beginning** of the lab period on the date indicated above.

- **Late lab reports (formal and informal) will receive an automatic 25% deduction. Lab reports turned in the following day will automatically lose 35%. Lab reports turned in 48 hours or more past the due time will not be accepted. A score of ZERO will be recorded for the experiment.**
- **THERE ARE NO MAKE-UP LABS IN CHEMISTRY 214.** In the event of an unavoidable absence, the instructor must be notified as soon as possible to obtain approval for attending another lab section. If no prior notice of the absence is given to the instructor, then a grade of zero will be given for the missed lab. **ALL STUDENTS MUST COMPLETE THE LAB SAFETY ORIENTATION ON DAY#1 IN ORDER TO REMAIN ENROLLED IN THE LABORATORY COURSE.** A student cannot receive a passing grade in this course unless at least **eleven** of the twelve lab experiment sessions are attended **and satisfactory reports for them handed in on time.** Attending a lab session and not performing the experiment does not constitute completing an experiment. Dry-labbing (analyzing data that you did not collect) is an honor code violation and will be dealt with accordingly. Lab grades will be normalized to a class mean of 80% for each laboratory section to ensure equity in the grading process.

Table 1. Breakdown of point distribution / CHEM 214 / Spring 2017

Item	Qty	#points each	Total points	%age of total
Informal Lab Reports	4	80	320 points	19.51%
Formal Lab Reports	7	110	770 points	46.95%
Quizzes	10	20	200 points	12.20%
Final Exam	1	250	250 points	15.24%
Lab Safety/Check-In	1	100	100 points	6.10%
			Total 1640 points	100.0%

GRADING---General Guidelines

The following is to serve as a general guide to determine whether or not a student performs satisfactorily in the laboratory component of the course. **Only grades of "C" and higher are considered passing and satisfy prerequisites for subsequent CHEMISTRY courses at George Mason University.**

Table 2. Performance and Grade

Relative %age per lab report	Rating	Overall %age for the course	Letter Grade
	Satisfactory	90 –100	A
80% (class mean)	Satisfactory	80-89	B
75%	Satisfactory	70-79	C
<70%	Unsatisfactory / Failing	60-69	D
	Unsatisfactory / Failing	0-59	F

Example: Prior to normalization, the above weighting factors (refer to Table 1) are applied and it is determined that the percentage of points earned is 66.0%; after normalization, the value is 68.4%. Performance at this level is considered unsatisfactory, demonstrating that the student has not acquired a mastery of the experiments (theoretical and experimental aspects), and the student will not be able to advance to the next level course, i.e, CHEM 313 (lecture) and CHEM 315 (lab) in this case. A failing grade ("D" or "F") will be entered, indicating unsatisfactory performance in the course.

- ***Lab grades are normalized to a class mean of 80% for all sections. Satisfactory performance per lab exercise (experiment and lab report) is >70%. **A score below 70% of the class mean on a lab report is considered UNSATISFACTORY and will not count toward successful completion of the lab exercise. Three (3) unsatisfactory grades will result in automatic failure of the laboratory course. Overall percentages will not be rounded in order to determine the letter grade for the course. For example, if a student's overall percentage for the course is 69.8, the value will not be rounded up to 70%.**
- FINAL GRADES FOR THE COURSE ARE REVIEWED AND APPROVED BY THE GENERAL CHEMISTRY LAB COORDINATOR, WHO IS A MEMBER OF THE FACULTY, PRIOR TO BEING POSTED ON PATRIOT WEB. (See GRADING POLICIES section below.)
- George Mason University does not dictate a grading scale. Instructors may determine cutoff points for A, B, C, etc. The use of plus and minus grades for A, B, C is also at the instructor's discretion.
- Letter grades for this course follow the standard guidelines for undergraduate courses. The grading assignments shown above (Table 2) will be used for this course.
- Do not rely upon a "curve". Maximize your overall performance irrespective of a "curve". Grading on a curve is not mandatory.

STUDENT RESPONSIBILITIES

- Each student is expected to be familiar with all announcements, updates, modifications to procedures, etc. that is posted on Blackboard. Grading rubrics, helpful hints to improve lab reports, sample lab reports, etc. are all posted on Blackboard.
- Each student is required to use his/her GMU email account for all communications with faculty and staff.**
- Participation in Laboratories is Critical:** Hands-on laboratory experience is critical to learning techniques, a key component to your success in future laboratory courses, in basic science courses. The laboratory introduces students to important concepts in chemistry in a very concrete way, reinforces concepts from the lecture, and teaching scientific thinking. **Laboratory work in this course is not optional; do your own work.** You cannot learn by simply watching your lab partner and operating in a spectator role. Every student is expected to be actively engaged in each laboratory exercise and to do the assigned laboratory work.
- Your work should be your own. Learning through interaction with your colleagues is encouraged, however, your report work and responses to questions posed for discussions/reflection, etc. must be uniquely yours. Since the integrity of scientific data is of utmost importance, all data and observations must be recorded directly into the lab notebook in blue or black ballpoint pen immediately. Data is not to be recorded on loose sheets of paper and/or in the lab manual, then transferred to the lab notebook.**

Failure to adhere to the above will result in initiating an academic integrity violation report, which can lead to failure in the course.

5. *****Because some laboratory activities in this course will be performed in pairs or groups, there may be some questions about what you can claim as your own work rather than as “group work”. Whenever you collect data as a group, all group members should have identical raw data entered into the computer database. Be sure to indicate lab partner/group member names on the pages of your lab notebook when appropriate.**
 - a. For example, lab partners will have identical data for an experiment and will retrieve class data from the [Results Retrieval website](#) . The data may be discussed but each student is responsible for processing his/her own data, generating his/her own charts and figures, **properly formatting the charts and figures independent of further interactions or communications with the lab partner/group members. SUPPLY LAB PARTNERS WITH ACCESS TO YOUR EXCEL DATA TABLES, FIGURES AND ANSWERS TO DISCUSSION QUESTIONS IS AN HONOR CODE VIOLATION. Using lab reports from a previous term is an honor code violation. Resources are made available to all students so that each student should be able to complete the lab report independent of the lab partner for the exercise.**
 - b. Sample calculations are to be completed independent of lab partners.
 - c. Discussion questions, summary and conclusions are to be written independent of lab partners or group members.
6. However, **ANYTHING you hand in for grading purposes with your name alone on it should be YOUR work.....even if the information has been previously discussed with your lab partner or as a group. NEVER COPY ANYTHING from someone else which you claim as your own. It is much better to not hand in an assignment than to copy another’s assignment...because this is a violation of the Honor Code...not only by the person(s) who copied, but also by the person who allowed the copying. This applies to work (laboratory assignments) that you completed in a previous semester and attempt to turn in at a later date if/when repeating the laboratory course. If you ever have questions about what is and is not appropriate, be sure to ask for clarification from the lab instructor, the Head GTA, or the GenChem Lab Coordinator in the department.**

OFFICE OF DISABILITY SERVICES

If you are a student with a disability and you need academic accommodations, please see the instructor after contacting the Office of Disability Services (ODS <http://ods.gmu.edu>) at 703-993-2474. All arrangements for academic accommodations must be initiated through that office. Students are required to notify instructors at the beginning of the semester and submit the documentation from the DRC. Paperwork submitted at the end of the semester will be applied to work that has not been attempted and graded; it will not be applied in a retroactive manner.

SAFETY

1. **Safety Rules & Regulations:** All students enrolled in the chemistry laboratory classes are expected to strictly follow the safety rules and regulations. Students will receive a warning on the first day that the lab class meets for the Check-In/Lab Safety, etc. Students that ignore the safety rules and regulations will receive a **40 points deduction** for the lab exercise being performed. **A student that continues to violate the safety rules and regulations will be permanently removed from the laboratory course, which will automatically result in a grade of “F” for the course.**

GRADING POLICIES

1. **Maintain Your Records:** It is your responsibility to maintain records of all graded materials. Lab instructors will regularly post scores on Blackboard, giving you an opportunity to double-check the scores in case of recording errors. Recording errors are to be cleared up with the lab instructor **prior to the last day of lab**. **Requests for re-grades and total points adjustment (due to addition errors, etc.) will not be entertained if more than 24 hours have passed after the graded material was returned to the class. All grading error issues must be discussed with the lab instructor first to resolve the matter. If the matter is not resolved within the 24 hour period, it is then vetted with the Head GTA for General Chemistry and MUST BE resolved within one week (during fall / spring semester; 24 hours during summer session) after receiving the graded material. Any grading matter that remains unresolved within the preceding time constraints, due to lack of attention on the student’s part, will not be considered for further action.**
2. **Grading Rubric:** The grading rubric for the formal and informal lab reports will be posted on the MASTER LAB SECTION Blackboard site. The rubrics will help you understand the expectations for the lab report, along with the discussion questions listed on the Results Retrieval website: <http://chem.gmu.edu/results> If you have questions or concerns about grades on quizzes or lab reports you should first meet with your lab instructor during office hours to discuss the matter. **The Head GTA (refer to Blackboard site) for General Chemistry will not meet with students to discuss grading matters if they have not gone through the proper channels. The lab instructor of record will be consulted prior to any and all meetings.**

HONOR CODE

- 1. GMU HONOR CODE:** All students enrolled in the course are expected to abide by the honor code. The instructor reserves the right to award a grade of zero for any plagiarized work. This includes any work that is not your own, *i.e.*, it has been copied from the internet or another classmate or used during the previous time that you took the course. Work that has been copied cannot be submitted for credit. In other words, copying another person's lab report will result in the lab instructor filing an honor code violation with the Office of Academic Integrity. It is your responsibility to be familiar with the GMU Honor Code and have a working knowledge of activities that are considered honor code violations: <http://oai.gmu.edu/honor-code/> ***Cheating, along with some examples of forms of cheating, can be found at <http://oai.gmu.edu/the-mason-honor-code-2/cheating/>.*** ***If you are complicit with cheating activity, inclusive of "giving help or information/work to a friend/classmate", then you will also be included in the honor code violation that is filed with the Office of Academic Integrity. (Refer to STUDENT RESPONSIBILITIES section above.)***
 - First time offenders will receive a grade of ZERO for the lab exercise (quiz and lab report).
 - Second time/repeat offenders will receive a grade of "F" for the lab, thereby resulting in a grade of "F" for the entire course. (If a student has previously been reprimanded for honor code violations in other courses at the university, the recommendation will be for a grade of "F" for course as well as expulsion from the university.)

STUDENT CONDUCT

- All students are expected to be familiar with the Student Conduct Code for George Mason University. Refer to the following link.
<http://studentconduct.gmu.edu/university-policies/code-of-student-conduct/>

The following is an excerpt from the Student Conduct Code and is something that all students should be aware of.

V. STUDENTS

The Code of Student Conduct and all applicable processes apply to undergraduate, graduate and professional students as well as all those individuals who are not officially enrolled for a particular term, but who have a continuing relationship with the University. Graduate and professional students may be subject to an additional procedure(s) or code relating to non-academic behavior. Such students are encouraged to consult with the chairperson or dean of such program or degree to see if any additional rules or procedures apply.

Students will also be held accountable for their conduct at all times including behavior that may have occurred before classes began, after classes ended, or if it was discovered after the student graduates. Additionally, inappropriate behavior during the academic year, between academic terms or during periods of suspension or dismissal is not permitted. All policies, processes, and procedures outlined in the Code shall also apply to a student's conduct even if the student withdraws from school while a disciplinary matter is pending.

LEARNING GOALS/EXPECTATIONS

- **Learning goals and expectations:** Learning goals for students enrolled in this course include chemistry body of knowledge, comprehension, critical and analytical thinking, communication, and presentation. Since the topics covered in the laboratory course vary each week, students will be exposed to the subject/topic areas and assessed at an introductory level.
 - a) Learn about general safety and operations in the laboratory
 - b) Aware of personal protective equipment (PPE) and always properly attired
 - c) Learn how to write a pre-lab (organization skills)
 - d) Interpretation of data and results
 - e) Quizzes at the beginning of the lab period each week to assess familiarity with reading assignment associated with the experiment
 - f) Pre-lab talks given to provide further clarity and present any modifications in the procedure
 - g) CUMULATIVE LABORATORY FINAL EXAM; mastery of concepts, calculations; application of topics to solve problems (theoretical and algorithmic)
 - h) Review of honor code and types of activity that will be reported to the Office of Academic Integrity.